

## **I. EXECUTIVE SUMMARY**

On May 14, 1997, a chemical explosion occurred at approximately 8:00 p.m., in a tank located in Room 40 of the Plutonium Reclamation Facility (PRF), which is part of the Plutonium Finishing Plant (PFP) at Hanford. The top of the tank was blown off, rupturing a fire suppression line and causing extensive damage. An Alert classification was declared by the U. S. Department of Energy (USDOE) at approximately 10:00 p.m. Most offsite agencies were notified by 11:20 p.m. The Washington Department of Health (the Department) was notified by 11:50 p.m.

The Department's Division of Radiation Protection has written the procedures manual *Response Procedures for Radiation Emergencies*. The Department responds to radiation emergencies at the Alert declaration. Upon receiving notification from the Washington State Military Department, Emergency Management Division, the Department's Emergency Response Duty Officer (ERDO) began notifying key staff to respond to the accident. Staff responded to the state's Emergency Operation Center (EOC), in Lacey, and the Unified Dose Assessment Center (UDAC) at the Federal Building in Richland. Two field teams surveyed for radioactive contamination and took environmental samples from areas both on and off the Hanford Site. No radioactivity above background was detected.

The USDOE terminated the Alert emergency the following morning at 6:41 a.m., May 15, 1997.

The Department is the state's lead response agency for emergencies involving the release of radioactive materials. Primary tasks of the Department are to locate, identify, and predict the impact of any radioactive materials released to the environment. Based on the predicted or known impact, the Department recommends appropriate measures to protect the public from exposure to radiation.

The authority for the Department's response to radiation emergencies is based on three specific mandates. The first is RCW 70.98, which establishes the Department as the state's radiation control agency. The second is Governor John Spellman's letter of August 28, 1983, which identifies the Department as the lead response agency to nuclear power plant accidents and directs the Department to "maintain a capability to assess any radiological hazards resulting from a Fixed Nuclear Facility emergency affecting the state of Washington." The third is RCW 43.06.010(12) and 43.06.200 - 43.06.270, which are the Governor's emergency powers. In addition, the *Public Health Improvement Plan (PHIP)* also identifies two core capacity standards requiring response for radiological accidents: to protect citizens from radiation exposure (PHIP #57), and to assist the affected counties in their planning and response to environmental hazards (PHIP #71).

This report includes a description of the response supporting field data activities, conclusions determined, and recommendations for improving response actions.

In addition, Appendix A is the Department's investigative report of the potential airborne release of radionuclides under the federal or state Clean Air Act.

## **II. DESCRIPTION OF RESPONSE ACTIVITIES**

The Department of Health's Division of Radiation Protection was guided by its procedures, *Response Procedures for Radiation Emergencies*, in its response to the accident on May 14, 1997, at the Hanford Site. The Emergency Response Duty Officer (ERDO) for the evening of May 14 was Al Conklin. The ERDO is the only emergency responder who is formally "on call" 24 hours a day, and carries the pager that is used as a contact point. Mr. Conklin mobilized the response team. Within two hours of notification, all of the Department's responders were in place: John Erickson and Dick Cowley responded to the State Emergency Operations Center (EOC) in Lacey; Dick Jaquish, Debra McBaugh, and Mark Henry responded to the Unified Dose Assessment Center (UDAC) at the Federal Building in Richland; Al Danielson, John Martell, John Schmidt, and Craig Lawrence formed two field teams. All times shown below are approximate and begin the evening of May 14, 1997.

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| 11:20 p.m. | The "crash call" from USDOE to offsite agencies occurred, notifying them of the explosion that had happened on the Hanford Site at 8:00 p.m. USDOE had classified the emergency as an Alert at 10:00 p.m. The plume constituents were unknown at this time. The crash call came to Washington State via the Military Department, Emergency Management Division (EM) at the State EOC.  |
| 11:50 p.m. | The ERDO was paged via the off-hours answering service. After getting the information from the answering service and the EM Duty Officer, Conklin contacted John Erickson, the Division Director, to discuss the extent of the Department's response. Per the response procedures, the Department mobilized staff at the Alert level. Also, because of the large amount of plutonium stored near the explosion and the scarce information available at the time, they decided to fully mobilize the Department's response. |
| 12:20 a.m. | Conklin's first task as ERDO was to seek assistance in contacting other responders. He succeeded in contacting Dick Cowley and Al Danielson. The three of them were successful   |

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in contacting enough people to staff the emergency centers with the Department's personnel.

- 12:25 a.m. Danielson contacted John Martell, Dick Jaquish, Mark Henry, and John Schmidt. He directed Henry and Jaquish to the UDAC, and Martell and Schmidt to the Department's onsite office in the 200 Area on the Hanford Site.
- 12:30 a.m. Erickson contacted available agency management Dr. Mimi Fields, State Health Officer, and Dr. Paul Stehr-Green, State Epidemiologist, to have them stand by.
- 1:15 a.m. Conklin contacted Debra McBaugh (already in Richland on other state business). She was directed to report to the UDAC.
- 1:00-1:30 a.m. Conklin arrived at his office in Olympia to establish a point of contact there and to continue coordinating the Department's response. Erickson and Cowley reported to the State EOC to provide technical advice to state and county decision makers. McBaugh, Jaquish, and Henry reported to the UDAC to provide technical support and to coordinate the Department's field teams. Danielson created two teams in the field and established contact with Henry in the UDAC.
- 1:30 a.m. First hard copy "Notification Forms" from USDOE arrived in the State EOC. Jaquish, in the UDAC, informed Danielson of the "take cover" order issued by USDOE for the PFP complex. Access to the Hanford Site and the Department's onsite office was in question because of the "take cover" order and its extent.
- 1:50 a.m. McBaugh formally established contact with Erickson and Cowley in the State EOC.
- 1:55 a.m. Danielson redirected Martell and Schmidt to Franklin County Emergency Management to pick up the field team equipment.
- 2:00 a.m. Erickson contacted Dr. Fields and Dr. Stehr-Green, updating them on the situation and asking them to remain on standby,

which they did for the remainder of the night.

- 2:45 a.m. Schmidt informed Danielson they could not gain entry into the Franklin County building where the field team equipment was located. Danielson directed them to return to the Department's onsite office where spare equipment is stored.
- 2:50 a.m. Henry informed Danielson that onsite field team readings taken by the USDOE field teams indicated background levels.
- 3:10 a.m. Jaquish directed Danielson to send a Washington field team to the Wye Barricade and downtown Richland to take air and soil samples, and to send the other field team to collect upwind air and soil samples.
- 3:30 a.m. Jaquish informed Danielson that onsite surveys in the 100 Area indicated background levels.
- 4:00 a.m. Danielson began collecting an air sample at the Department's onsite office. He also performed radiation surveys in the area, finding no measurable radioactivity above background.
- 4:10 a.m. Field Team #2 (Martell and Schmidt) began taking samples at the Wye Barricade.
- 4:45 a.m. Field Team #1 (Danielson and Lawrence) began taking samples at Gate 121B, which is upwind but just off the Hanford Site.
- 6:30 a.m. Danielson began the analysis of the air sample from the onsite office, which required recounting in one hour to account for the presence of radon.
- 6:41 a.m. Alert classification terminated. USDOE, state, and county EOCs shift from emergency phase into recovery phase. Field teams continued to collect samples and monitor for radioactivity offsite.
- 7:30 a.m. Danielson completed the analysis of the air sample from the onsite office, which showed no measurable radioactivity above background. Field teams began to arrange to transport the samples to the state laboratory for a detailed analysis.

### III. CONCLUSIONS AND RECOMMENDATIONS

#### A. USDOE ACTIONS

##### 1. Classification and Notification

**Issue #1:** USDOE did not classify the accident as an Alert level emergency promptly, as required in the Hanford Emergency Plan, DOE/RL-94-02. It took two hours and ten minutes to classify the explosion as an emergency.

**Issue #2:** USDOE did not notify offsite agencies of the Alert within the required fifteen minutes. It took one hour and twenty minutes after the accident was classified, before offsite agencies were notified.

The principle concern arising from the accident of May 14 is USDOE's failure to properly classify the accident as an emergency in a timely manner and to provide timely notification to offsite agencies. This concern was also shared by Benton, Franklin, and Grant Counties. The explosion occurred just before 8:00 p.m.; offsite agencies were not notified until 11:20 p.m., over three hours later. To put this in perspective, if there had been a release of radioactivity because of the explosion, citizens in Richland would have been exposed to radiation by the plume (because of wind speed and direction) before any offsite agency could have issued evacuation or shelter warnings. Therefore, prompt notification is essential in providing adequate public safety.

It is the responsibility of the Building Emergency Director (BED) to classify an accident as an emergency. The BED can refer to several procedures to classify the accident, to provide initial notifications to onsite and offsite emergency responders, to recommend protective actions for the employees onsite and the public offsite, and to request assistance. However, the procedures for the BED were, and still are, incomplete, conflicting, cumbersome, and inadequate. All BED procedures should be reviewed by USDOE together with contractor emergency preparedness staff, contractor facility operations staff, and the workers. The Department's and Ecology's staff, along with other offsite agencies' staff, should participate in the development and implementation of this review. Offsite agencies were not aware of some of the BED procedures. It is

critical for offsite agencies to be aware of onsite procedures and to understand the USDOE's decision-making process in order to implement the best protective action for its citizens. An element of trust is built when response agencies recognize and agree with the processes and abilities of the onsite emergency responders.

The procedure to classify the accident as an Alert, Site Area Emergency, or General Emergency is through the Emergency Action Levels (EALs), contained in the *Emergency Implementing Procedures, DOE 0223*. An EAL is an observable condition (such as an explosion) that initiates the process to classify an emergency and to activate the plan. In this accident, the only EAL for an explosion was based on suspected terrorist action and required the identification of an explosive device in order to classify it as an emergency. This, of course, was the incorrect EAL to apply, but the only one thought to be available. There was no provision (EAL) for an emergency to be declared by an observed explosion at PFP where an obviously apparent offsite hazard is located (e.g., a facility containing several tons of weapons-grade plutonium). This confusion was part of the delayed response. The EAL finally used to declare the Alert two hours later was based on degradation of the facility and the need for offsite assistance.

Not including all applicable scenarios in PFP's EAL development process illustrates the necessity for offsite agencies to become more involved with USDOE in reviewing and improving EALs for all Hanford facilities.

**Recommendation:** USDOE should review all BED emergency procedures, especially the EALs, for conflicts, omissions, redundancy, and efficiency. Offsite response agencies deal with emergencies on a regular basis. Their expertise in determining response actions based on conditions would enhance USDOE's review. The review process needs to include participation by offsite agencies.

**Recommendation:** USDOE should determine the causes of the offsite notification delay, then propose draft corrective actions for offsite agency review.

2. Medical Treatment of Hanford Workers

**Issue #3: USDOE did not responsibly handle the immediate health effects or the follow-up medical assessment of the Hanford workers exposed to the plume of hazardous chemicals.**

The health and safety concerns and treatment of the Hanford workers who were exposed to the plume of hazardous materials were inadequate. The manner in which they were treated was not consistent with established industrial safety laws and regulations. These people are Washington State citizens; their employment by USDOE contractors should not preclude them from receiving adequate medical care. Laws for worker safety that apply to other facilities handling hazardous materials should also apply to the USDOE. Other industries within the state do not self-regulate. The USDOE should follow suit and allow an outside authority to oversee.

**Recommendation: USDOE should be regulated by an outside agency with worker safety and industrial hygiene authority. Laws that protect worker safety in all other industries must apply to Hanford workers.**

3. Safe Handling of Chemicals

**Issue #4: USDOE did not adequately monitor the concentration of chemicals known to become explosive when not diluted.**

The chemicals that caused this explosion were not handled correctly by USDOE. According to USDOE (Appendix B, *Accident Investigation Board Report...*), the chemicals were allowed to become more concentrated by evaporation; the explosion could have been prevented if the chemicals had been kept diluted or removed from service. The Department is concerned about this and other examples of an apparent failing infrastructure at Hanford and the pressure on USDOE to clean up Hanford faster and more efficiently. Also, because of the changing nature of the hazards at Hanford during the cleanup, the potential for future accidents is cause for concern. The Washington Department of Ecology, with support from the Department, is investigating the chemical safety issue at Hanford.

**Recommendation: USDOE must review its procedures on handling chemicals to ensure they are properly and legally maintained. Inventories of all storage tanks need to be characterized and monitored regularly until disposed or rendered totally safe.**

4. Emergency Preparedness as a Priority

**Issue #5: To offsite agencies, it does not appear USDOE addresses emergency preparedness as a continuous priority.**

USDOE appears to be under pressure to clean up Hanford faster and with fewer dollars. Emergency preparedness is an easy target for budget reductions. Moreover, the root cause of this accident appears to be failure to monitor the chemicals that exploded (Appendix B, *Accident Investigation Board Report...*) which could have been prevented. USDOE funds emergency preparedness inadequately, especially for itself, but also for offsite agencies. This has been documented over the years with USDOE and offsite agency correspondence. This Department operates yearly on funding which is less than adequate. A minimum level of emergency preparedness will result in a minimum level of protection, as this accident clearly illustrated.

**Recommendation: USDOE must ensure that preparedness and mitigation are important parts of the cleanup effort, not afterthoughts.**

B. DEPARTMENT OF HEALTH ACTIONS

This accident has provided a very good opportunity to test the Department's response to an actual emergency. In drills and exercises, everyone knows there will be some kind of emergency response. The only issue is how to respond to the specific accident scenario of the exercise. In this case, the Department had to respond in the middle of the night with no warning. People had to make the transition from "normal" mode to "emergency" mode in real life, which is something they never get to do in drills or exercises. It is most interesting to note that DOE's failure to make this transition was one reason for its failure to notify offsite agencies until almost three and a half hours after the explosion. The Department has learned that efforts in emergency planning and preparedness were adequate, but require improvement. Trained staff from the Department responded to the accident quickly. Within two hours, the Department's representatives were at the State EOC and the UDAC, and field teams were prepared to measure radioactivity offsite. Notification of the Department's emergency responders was successful, considering no one is required to follow official "on call" protocols, except the ERDO. Several issues have been identified.

1. Classification and Notification



**Issue #6: Not all Department of Health's emergency responders who were called could be reached during off hours because they are not required to be "on call" at all times.**

The notification procedures for the Department's emergency responders and Management Team need improvement. The ERDO spent many minutes attempting to call first shift responders who were not available by phone or pager at midnight. Since there is no requirement for the Department's responders to be officially "on call" 24 hours a day (i.e., have their pagers on), the ERDO got only answering machines on several of his calls. This notification problem resulted in delay.

**Recommendation: The Department will evaluate a policy change to require emergency responders to be officially "on call" (i.e., have their pagers on).**

**Issue #7: Department of Health responders need to be more familiar with the BED procedures and the EALs.**

The USDOE has been reluctant to include offsite agencies in the review of Hanford EALs and procedures prior to their issuance. A review of draft EALs by offsite agencies would help them be aware of what is happening onsite during an accident. Outside reviewers also give a different perspective not available with in-house reviewers.

**Recommendation: The Department should participate in the review and revision of all BED procedures on a limited basis to ensure the system will work. Reviews will be done on all facilities with offsite consequences. Others will be done on a case-by-case basis.**

2. Only One Shift of Trained Responders

**Issue #8: Not all Department of Health's emergency responders are specifically trained to respond to a Hanford accident.**

Resources do not allow all the Department's responders to be trained for Hanford-specific response roles. For example, the UDAC representative who was coordinating the offsite field teams was not aware of his responsibility to also coordinate with the dispatcher of the onsite field teams. Currently, only one shift of responders is trained in a year. Because of people changing response positions, new people on staff, and vacation/sick leave, it would be preferable to have two complete shifts of responders trained. Emergency centers need to be able to be staffed 24 hours a day.

Because of the low probability of a Department's responder being specifically trained for Hanford emergencies, USDOE needs to take the lead in coordinating the response in the Hanford EOC and UDAC. Due to a lack of knowledge, a Department representative was not available at the field team coordination center or at the decision table. Staff would have been accommodating had the USDOE explained the existence of those positions. It should be USDOE's responsibility to ensure that offsite responders in its EOC are briefed on what has already occurred, what is expected to occur, and any unmet expectations. The Department will address training more responders as resources allow.

**Recommendation: The Department needs to identify additional resources in order to train more staff to become familiar with the hazards and emergency response actions related to a Hanford accident.**

3. Hanford Emergency Assessment Resource Manual (HEARM)

**Issue #9: The HEARM did not include any description of the hazards at the facility where the explosion occurred.**

**Issue #10: The HEARM was not up to date in the state EOC.**

The resource manual which assists the offsite agencies to identify facilities at Hanford and their hazards was not very useful. The HEARM is the resource manual which describes Hanford facilities and gives the offsite consequences of some accident scenarios. Apparently, the hazards at the facility were not in the HEARM because USDOE had determined that an accident with offsite consequences could not occur there. The process used by USDOE to update the Final Safety Analysis Reports (FSAR) to

determine if a Hanford facility is to have its hazards described in the HEARM should include the Department for review.

The facility where the accident happened could not be found in the HEARM at the state EOC. The Department's staff in the state EOC spent time unnecessarily trying to find the PRF in the HEARM.

**Recommendation:** The criteria for including a description of the hazards at Hanford facilities in the HEARM must be re-examined by USDOE, with the Department participating.

**Recommendation:** Controlled manuals used by the Department's staff in the state EOC must be kept up to date.

4. Paying for the Cost of Responding

**Issue #11:** The Department has no way to pay for the cost of its response.

The Department's USDOE emergency preparedness grant does not cover "emergency response," it covers "planning." The cost of the Department's response for this accident will be about \$15,000, and since the planning grant is the only source of funding currently available from the USDOE, response charges will result in an over-expenditure at the end of our USDOE grant funding cycle in September.

**Recommendation:** Department of Health management needs to address the proper way to pay for this expense.

5. Laboratory Issues

**Issue #12:** The state laboratory has no resources for planning for Hanford specific accidents.

The state laboratory is prepared to handle radiation emergencies in general, and specifically WNP-2 accidents involving fission products. However,

there were no procedures or resources to address those items that may be Hanford-specific; e.g., plutonium measurement.

**Recommendation:** The Department's Division of Radiation Protection, in cooperation with the laboratory, must address ways to work with USDOE to support the laboratory in developing and training in Hanford-specific emergency procedures.

6. Access to Field Team Equipment

**Issue #13:** The Department's emergency responders could not get to the emergency equipment stored at Franklin County Emergency Management.

Field team equipment such as Geiger counters and sampling equipment is stored at the Franklin County Emergency Management offices in Pasco. Since Franklin County emergency responders report to the bi-county EOC in Kennewick, their offices were closed and locked. The only Department responder with a key was on vacation. The Department's planners are looking for a more suitable location for emergency equipment.

**Recommendation:** The Department needs to find a suitable location for field team equipment in the Tri-Cities area.

7. Adequacy of Field Team Air Sampling Equipment

**Issue #14:** Due to the large sample volume needed to detect a "puff" release of plutonium in air above environmental levels, the Department's emergency air sampling procedures and equipment need to be revised.

Air samples were taken using air filters which are part of the Hanford and WNP-2 environmental monitoring network. These low-flow air samplers are used to determine trends in ambient conditions and can detect spikes in fission products. They cannot detect a "puff" release of plutonium in air above environmental levels without drawing large volumes of air. The Department's emergency air sampling procedures and equipment need to be revised.

While the Department has much baseline data for gross beta in air, little exists for gross alpha. Gross alpha in air particulate samples is not a test the Department considers reliable. Sediment loading and the filter's glass fiber matrix impact the ability for alpha particles to be detected dependably. Furthermore, the gross alpha analysis would not be able to detect plutonium at or near environmental levels because the disintegrations from plutonium would be much less than those from the naturally occurring emitters.

Air samples analyzed for plutonium by alpha spectroscopy did not reveal elevated plutonium levels. Detection is dependent upon recording the actual decay event in the detector. Because of the low specific activity of plutonium, there needs to be enough plutonium present to make detection of a decay event likely. High efficiency, high volume air particulate samplers are needed to improve the Department's ability to detect small amounts of plutonium.

**Recommendation: The Department must review air sampling needs during emergencies for plutonium, and revise procedures and purchase equipment as necessary.**

8. Detecting Plutonium in Soil Samples

**Issue #15: Due to the difference in the data quality objective for environmental soil sampling and emergency soil sampling, the Department's emergency soil sampling procedures and equipment need to be revised.**

The Department's standard soil collection protocol was followed; soil was collected to a one-inch depth. The results for plutonium analyses reflect results from previous samples taken near the Hanford Site. These samples alone did not provide the data needed to assess whether a very small release occurred. Other sample types should have been collected (e.g., technical smears and instrument surveys of horizontal surfaces such as cars, buildings, and sidewalks; skimming of surface soils, etc.), analyzed, and interpreted. Using the current sampling protocol allows the comparison of data collected during the emergency to other samples collected prior to an accident. The establishment of a sampling grid and baseline information for the other types of samples needs to be conducted.

The soil sampling procedure needs to be modified for the initial stage of an emergency response. Only the very surface of soil should be collected, which may be accomplished by directing the field teams to solid surfaces such as parking lots, sidewalks, and car tops, then instructing the team to collect the surface dirt. This procedure would work well for collecting a sample for actinide analysis where only a few grams of sample are needed. Also needed is baseline data, collected by the same procedure, for comparison during emergencies.

**Recommendation: The Department must review its soil sampling procedure, especially for Hanford accidents, and revise as appropriate.**

C. IN CONCLUSION

The primary purpose of the Department in responding to a Hanford emergency is to evaluate the need for offsite protective actions, which include the following:

- Should the public be evacuated?
- Should the public shelter in place?
- Is there radioactivity in the air, food, or water supply?
- Are people's homes safe from contamination?

In this accident, where an explosion was sudden and without warning, the evaluation of whether or not protective actions for the offsite public were required had to occur immediately. Since offsite agencies were not notified until over three hours after the explosion, they did not participate in the evaluation of offsite protective actions. The USDOE made the determination that offsite protective actions were not necessary when they chose not to classify the event or notify the offsite agencies promptly. This was an implied decision, not a coordinated recommendation. By the time the Department responded to the UDAC, the need for us to evaluate future protective actions no longer existed. In retrospect, the UDAC determined that USDOE had made the correct decision in not recommending offsite protective actions such as evacuation or shelter.

Since the primary purpose of the Department's UDAC responders was over before they arrived, their main task was to document what had already happened and to begin the measurement of radioactivity offsite. The field teams monitored offsite

for radioactivity in the air and on the ground, and found none. The Department's field teams do not have adequate equipment to detect plutonium in air, especially at very low levels of concentration. It is therefore necessary to rely on USDOE's measurements near the accident in order to protect the public and the Department's responders in the field. It is troubling to note that the USDOE did not monitor for hazardous chemicals after the explosion until much later in the event sequence.

#### **IV. SUPPORTING DATA**

##### **Washington State Department of Health**

Results of soil and air particulate samples collected in response to the plutonium refinishing plant accident, 5/15/97. Activities are in pCi/g (dry) for soil and pCi/m<sup>3</sup> for air particulate. Uncertainty is expressed as 2 sigma counting error.

<b>Media</b>	<b>Location</b>	<b>Analyte</b>	<b>Activity</b>	<b>Uncertainty</b>	<b>Comment</b>
Soil	WNP-2, Station 8	Gross Beta	2.27E+01	2.00E-01	
		Be-7	2.50E-01	1.00E-01	
		K-40	1.91E+01	7.00E-01	
		Cs-137	1.90E-01	2.00E-02	

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		Pu-239/240	5.10E-03	2.60E-03
		Pu-238	-2.00E-03	3.00E-03
Soil	Gate 121-B	Gross Beta	1.87E+01	2.00E-01
		K-40	1.49E+01	6.00E-01
		Cs-137	5.10E-02	1.40E-02
		Pu-239/240	1.00E-03	2.00E-03
		Pu-238	1.00E-03	4.00E-03
Soil	Wye Barricade	Gross Beta	1.70E+01	2.00E-01
		Be-7	4.40E-01	1.10E-01
		K-40	1.56E+01	6.00E-01
		Cs-137	2.60E-01	2.00E-02
		Pu-239/240	5.00E-03	3.00E-03
		Pu-238	-2.00E-03	3.00E-03
Soil	Columbia Pt. Marina	Gross Beta	1.90E+01	2.00E-01
		Be-7	2.00E-01	1.00E-01
		K-40	1.75E+01	6.00E-01
		Cs-137	2.70E-02	1.10E-02
		Pu-239/240	0.00E+00	1.00E-03
		Pu-238	-1.00E-03	3.00E-03
Soil	Ringold	Gross Beta	2.19E+01	2.00E-01
		Be-7	3.00E-01	3.00E-02
		K-40	1.61E+01	6.00E-01
		Cs-137	3.30E-02	1.20E-02
		Pu-239/240	1.00E-03	2.00E-03
		Pu-238	2.00E-03	3.00E-03

<b>Media</b>	<b>Location</b>	<b>Analyte</b>	<b>Activity</b>	<b>Uncertainty</b>	<b>Comment</b>
Air Particulate	WNP-2, Station 8	*Gross Alpha	5.60E-03	1.10E-03	171.8m <sup>3</sup>
		Gross Beta	2.80E-02	2.00E-03	
		Be-7	1.60E-01	4.00E-02	
		Cs-134	5.00E-03	2.00E-03	
		Cs-137	0.00E+00	2.00E-03	
		Pu-239/240	2.00E-05	5.00E-05	
		Pu-238	2.00E-04	3.00E-04	
Air Particulate	WNP-2, Station 4	*Gross Alpha	1.30E-02	2.00E-03	161.9 m <sup>3</sup>
		Gross Beta	4.80E-02	2.00E-03	
		Be-7	3.40E-01	7.00E-02	
		Cs-134	2.00E-03	3.00E-03	
		Cs-137	-2.00E-03	3.00E-03	



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		Pu-239/240	1.00E-04	2.00E-04	
		Pu-238	4.00E-04	4.00E-04	
Air Particulate	DRP Office at US Ecology	*Gross Alpha	2.00E-02	2.30E-02	8.7 m <sup>3</sup>
		Gross Beta	9.70E-02	4.70E-02	
		Cs-134	4.00E-02	7.00E-02	
		Cs-137	0.00E+00	8.00E-02	
		Pu-239/240	8.00E-04	3.00E-03	
		Pu-238	0.00E+00	1.00E-02	
Air Particulate	Gate 121-B	*Gross Alpha	1.00E-02	1.80E-01	0.93 m <sup>3</sup>
		Gross Beta	4.80E-01	4.20E-01	
		Cs-134	-1.00E-01	6.00E-01	
		Cs-137	0.00E+00	6.00E-01	
		Pu-239/240	-7.00E-03	1.30E-02	
		Pu-238	3.00E-02	6.00E-02	
Air Particulate	WYE Barricade	*Gross Alpha	1.50E-02	2.00E-03	171.3 m <sup>3</sup>
		Gross Beta	4.80E-02	2.00E-03	
		Be-7	2.70E-01	4.00E-02	
		Cs-134	0.00E+00	2.00E-03	
		Cs-137	-1.00E-03	2.00E-03	
		Pu-239/240	2.00E-05	2.00E-04	
		Pu-238	-1.00E-04	5.00E-04	

<p>* Gross Alpha analysis in air particulate is not quantitative. Results are given for indication value only.</p>
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